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## CLAIMS:

1. A method of determining topology of an optical WDM (wavelength division multiplex) network in which optical signals comprising a plurality of WDM optical channels are  
5 communicated, comprising the steps of:

modulating each optical channel with a respective signal comprising a channel identity;

10 10. detecting the channel identities of all of the optical channels in an optical signal at each of a plurality of points in the network to produce a channel list for each of said points; and

identifying matched pairs of channel lists to determine optical paths of the network between pairs of said points.

15 2. A method as claimed in claim 1 wherein the step of detecting channel identities comprises detecting the channel identities of all of the optical channels in an optical signal at each of a plurality of optical paths entering or leaving each of a plurality of nodes of the network.

20 3. A method as claimed in claim 1 wherein the step of detecting channel identities comprises detecting the channel identities of all of the optical channels in an optical signal at a multiplex port of each of a plurality of optical band filters to produce a respective channel list M, and determining  
25 a channel list T for a through port of the respective optical band filter, the channel list T comprising channels of the list M which are not within a pass band of the filter.

4. A method as claimed in claim 3 wherein the step of identifying matched pairs of channel lists comprises, for each  
30 of a plurality of nodes of the network, identifying matched

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pairs of channel lists among the channel lists M and T for different optical band filters of the node to determine optical paths within the node.

5. A method as claimed in claim 4 wherein the step of identifying matched pairs of channel lists further comprises, for each of the nodes, identifying any optically transparent optical band filters for which the channel lists M and T are the same, and identifying any channel lists, from among said matched pairs of channel lists of the node, matching said same channel lists M and T to determine optical connections of said optically transparent optical band filters within the node.

6. A method as claimed in claim 1 wherein the step of modulating each optical channel with a respective signal comprising a channel identity comprises variably attenuating an optical signal of the optical channel in dependence upon a signal comprising the respective channel identity.

7. A method as claimed in claim 6 wherein the signal comprising the respective channel identity has a frequency of the order of about 1 MHz or less.

20 8. A method of determining topology of an optical WDM (wavelength division multiplex) network in which optical signals comprising a plurality of WDM optical channels are communicated among a plurality of nodes of the network, comprising the steps of:

25 modulating each optical channel with a respective signal comprising a channel identity;

for each of a plurality of optical paths entering or leaving each of a plurality of nodes, determining a channel list of all the optical channels in an optical signal on the 30 optical path, this step comprising detecting the channel

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identities of all of the optical channels in an optical signal at each of a plurality of points; and

identifying matching channel lists to determine optical paths of the network between the nodes.

5 9. A method as claimed in claim 8 wherein the step of determining a channel list of all the optical channels in an optical signal on an optical path entering or leaving a node comprises detecting the channel identities of all of the optical channels in an optical signal on the respective optical  
10 path.

10. A method as claimed in claim 8 wherein the step of determining a channel list of all the optical channels in an optical signal on an optical path entering or leaving a node comprises, for each node:

15 detecting the channel identities of all of the optical channels in an optical signal at a multiplex port of each of a plurality of optical band filters of the node to produce a respective channel list M;

determining a respective channel list T for an  
20 optical signal at a through port of the respective optical band filter, the channel list T comprising channels of the respective list M which are not within a pass band of the optical band filter;

identifying matching channel lists M and T to  
25 determine optical paths within the node; and

identifying unmatched channel lists M or T as channel lists for optical path entering or leaving the node.

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11. A method as claimed in claim 10 wherein the step of identifying matching channel lists M and T to determine optical paths within the node comprises identifying any optically transparent optical band filters of the node for each of which 5 the channel lists M and T are the same; identifying matched pairs of the other channel lists M and T for the node to determine optical paths between respective ports of different optical band filters within the node; and identifying any channel lists, from among said matched pairs of channel lists 10 for the node, matching said same channel lists M and T to determine optical connections of said optically transparent optical band filters within the node.

12. A method as claimed in claim 8 wherein the step of modulating each optical channel with a respective signal comprising a channel identity comprises variably attenuating an 15 optical signal of the optical channel in dependence upon a signal comprising the respective channel identity.

13. A method as claimed in claim 12 wherein the signal comprising the respective channel identity has a frequency of 20 the order of about 1 MHz or less.

14. An optical WDM (wavelength division multiplex) network comprising a plurality of nodes and optical paths for communicating optical signals, comprising a plurality of WDM optical channels, within and among the nodes, the network 25 comprising:

a source for each optical channel;

a modulator for modulating each optical channel with a respective signal comprising a channel identity;

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a plurality of optical filters for combining optical channels to produce optical signals and for separating optical signals to derive optical channels from the optical signals;

- 5 a plurality of detectors for detecting the channel identities of all of the optical channels in an optical signal at each of a plurality of points in the network to produce a channel list for each of said points; and

- 10 a network management system for identifying matched pairs of said channel lists to determine optical paths of the network between pairs of said points.

15. An optical WDM network as claimed in claim 14 wherein the optical filters comprise optical band filters each having a multiplex port, an add or drop port, and a through port, and said plurality of points in the network comprise multiplex 15 ports of the optical band filters.

16. An optical WDM network as claimed in claim 15 wherein the network management system is arranged to determine a channel list for a through port of an optical band filter by omitting, from optical channels of a channel list for the 20 multiplex port of the respective optical band filter, optical channels within a pass band of the optical band filter.